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(54) FRAME STRUCTURE

(71) We, KUNSTSTOFF G.m.b.H., a German limited liability company, of Leopoldstrasse 8, 49 Herford, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a frame structure comprising frame members and corner connectors, and which structure can accept a heavy load and which can for example be used as a frame for supporting a bookshelf.

According to the invention, there is provided a frame structure comprising frame members and corner connectors, wherein:—

i) each frame member includes a square-section plastics tube within which is disposed a circular-section metal tube in operative contact with the inner surfaces of the walls of the square-section tube;

ii) each corner connector has a projection or projections engaging in the square-section tube of each frame member to which it is connected to prevent rotation of the frame member relative to the corner connector; and

iii) each corner connector has cylindrical extension pieces each engaging in a respective circular-section metal tube, the outer diameter of each extension piece corresponding substantially to the inner diameter of the circular-section metal tube.

In one embodiment of the invention, the projections of each corner connector may engage into chambers formed between the square-section tube and the circular-section tube.

A two or three-dimensional frame in accordance with the invention may be inexpensively manufactured and assembled, since the square- and circular-section tubes are standard commercial items and can be fitted together by press fit, that is, without additional fixing means.

The corner connectors may also be of plastic material, so that, with the plastics square-section tubes and the metal circular-section tubes, a corrosion-protected frame

structure of low weight but high loading capacity is produced.

Embodiments of the invention will now be described in greater detail by way of example, with reference to the attached drawings, in which:—

Figure 1 is a perspective view of a corner connector and an associated frame member, the latter being shown partly in section;

Figure 2 is a perspective view of another embodiment of corner connector and an associated frame member; and

Figure 3 is a perspective view of a modified form of the corner connector of Figure 2.

Referring to Figure 1, a frame member 1 comprises a square-section plastics tube 2 within which is disposed a circular-section tube 3 of metal. The tube 3 is in contact with inner walls of the square-section plastics tube 2 and is operatively connected to the latter. Between the metal tube 3 and the square-section plastics tube 4 there is a press fit such as to ensure fixing of the tube 3 in the tube 2.

The tube 3 ends as shown at a distance from the end face 4 of the square-section tube 2. This provides a housing 5 for a rectangular projection 6 of a corner connector 7, by which non-rotatable connection is achieved between the corner connector 7 and the frame member 1.

The rectangular projection 6 is rigid with cylindrical extension pieces 8, the outer diameter of each of which corresponds substantially to the inner diameter of the tube 3. Each extension piece 8, when frame members 1 are fitted onto the corner connector 7, fits into a tube 3.

Referring to Figure 2, a circular-section metal tube 9 extends over the entire length of a square-section plastics tube 10. A corner connector 11 has cylindrical extension pieces 12, the outer diameter of which corresponds substantially to the inner diameter of the tube 9, so that each extension piece can fit into the interior of a tube 9 when connection is made between the corner connector 11 and a frame member 1.

